

Heat Sink Riveted to Memory Module with Upper Slots and Open Bottom Edge for Air Flow

Abstract

A memory module has a two-plate heat sink attached by rivets. A front plate contacts the flat surfaces of memory chips on a front surface of the module printed-circuit board (PCB) substrate, while another back plate contacts chips on the back surface of the substrate. The plates contact the substrate along the top edge opposite the connector edge, and along the upper half of the substrate's side edges. Holes in the substrate allow for rivets or other fasteners to pass through to firmly attach the plates to the substrate, prevent wobble. Four top-edge slots are cut in the plates near the top edge, between the rivets along the top edge. The top-edge slots allow air to flow underneath the plates, in small gaps between memory chips, and between the plate and the substrate. The added air flow underneath the plates helps cool the heat-sink plates, reduce hot spots and failures.